

## PATENT ABSTRACTS OF JAPAN

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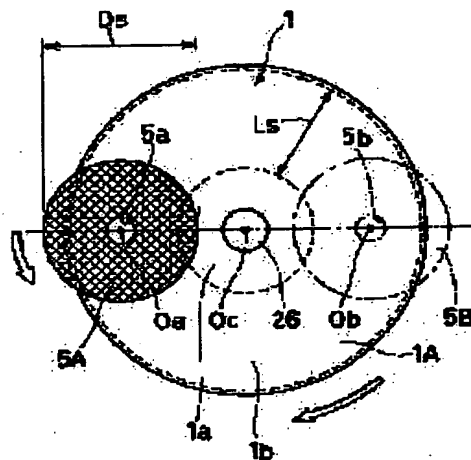
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## (54) DISK CLEANER

## (57)Abstract:

**PROBLEM TO BE SOLVED:** To provide a disk cleaner capable of properly eliminating scratches and dusts stuck to a disk without causing any waveiness in the disk, easily performing the switching of polishing tools and being easily handled.

**SOLUTION:** This cleaner polishes a surface 1A to be polished by pressing a polishing tool 5A (5B) composed of a buff or the like to the polished surface 1A of a disk 1 and rotating the polishing tool 5A (5B), and the rotary axis 0a (0b) of the polishing tool 5A (5B) is arranged to be vertical to the polished surface 1A. Thus, the pressing of the respective parts of the polishing tool 5A (5B) to the surface to be polished 1A of the disk 1 are made uniform and consequently, the uneven wearing of the polishing tool 5A (5B) is prevented, the flatness of the polished surface by the polishing tool 5A (5B) is maintained and the inconveniences such as disk waviness is prevented.



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## DETAILED DESCRIPTION

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[Detailed Description of the Invention]

[0001]

[Field of the Invention] This invention relates to the thing it is made to have said polished surface-ed polished about the disk cleaner used in order to remove a blemish, dirt, etc. with which the front face of disks, such as an optical disk as an information record medium or a magneto-optic disk, was stained by pressing against the polished surface-ed the polish implement which consists of a buff etc., and making it rotate, rotating said disk especially.

[0002]

[Description of the Prior Art] When the front face, especially a recording surface are stained with a blemish, dirt, etc. in such a disk, it becomes impossible to read the recording information of the part stained with the blemish and dirt, and it becomes impossible appearance not only to worsen, but in recent years, to reproduce proper as sound and the object for images, or an information record medium for computers, although disks, such as a laser disc, CD (compact disk), and CD-ROM, have generally spread widely.

[0003] Therefore, manually, while taking time and effort and time amount, a blemish, dirt, etc. are fully unremovable in the former, although he is trying to remove a blemish, dirt, etc. of a disk manually using a cross etc. Especially in the place where disks, such as a used CD store and a library, are held in large quantities at, and are replaced frequently at, or a loan is performed, since a great effort will cleave to the blemish of a disk, or removal of dirt, enabling it not handicraft but to carry out mechanically and automatically is expected the blemish of this disk, and removal of dirt strongly.

[0004] The disk cleaner it is made to have said polished surface-ed polished is proposed by pressing the rotation peripheral surface of the polish implement of the shape of a cylinder, such as a buff, against the polished surface-ed of the disk (recording surface), and rotating this polish implement, making the former, for example, JP,7-122038,A, rotate a disk in order to meet such a request.

[0005]

[Problem(s) to be Solved by the Invention] By the way, if it was in the disk cleaner of said proposal, there were the following problems. That is, the thing of the \*\* aforementioned proposal is made to press the rotation peripheral surface of a polish implement against the polished surface-ed of a disk. Since in other words axis of rotation of said polish implement is arranged in parallel to said polished surface-ed at the time of polish, the same side periphery of a polish implement will always be pressed by the back end side to each part of a disk to the inner circumference part of a disk like the periphery part of a disk for example, the tip side of a polish implement. In this case, since the peripheral velocity of a periphery part is quicker than the peripheral velocity of the inner circumference part of a disk, if the degree of the said cylinder of a polish implement and parallelism with a polished surface-ed are not maintained correctly, it will become easy to produce a wave etc. on all the front faces of a disk.

[0006] \*\* In polishing a disk, it is desirable as a polish implement to prepare the thing for rough machinings (for blemish removal) and the thing for polishes (glazing, finishing). Since only the polish implement of a piece is pressed to one polished surface-ed of a disk, the thing of said proposal must exchange frequently the polish implement for blemish removal, and the polish implement for polishes, and is inconvenient.

[0007] \*\* In the thing of said proposal, the polish implement to a disk presses and the force cannot be adjusted. Since a polish implement is worn out and deforms according to a polish activity, if it presses and the force cannot be adjusted, there is a possibility that necessary may press against a polish implement, the force may no longer be given, and it may become impossible to perform removal of a blemish or dirt proper.

\*\* In the thing of said proposal, in case a disk is detached and attached, and in case exchange of a polish implement etc. is performed, the arm for disk maintenance must be made to rock in the direction of a path of a disk (horizontal direction) with a disk drive motor, and handling is troublesome.

[0008] \*\* the contact surface of a polish implement [ as opposed to / since the effective means against it for which it is necessary to maintain correctly the cylindricity of a polish implement and parallelism with a polished surface-ed as mentioned above nevertheless is not provided in the thing of said proposal / a disk ] -- it cannot press and the force cannot polish dispersion and a disk to homogeneity. Without making a disk produce faults, such as a wave, the place which this invention was made in view of such a problem, and is made into the purpose is to offer the disk cleaner it enabled it to deal with easily while being able to remove the blemish and dirt with which the disk was stained proper and being able to change a polish implement easily.

[0009]

[Means for Solving the Problem] It is made for the disk cleaner concerning this invention to have said polished surface-ed fundamentally polished by pressing against the polished surface-ed of said disk the polish implement which consists of a buff etc., and rotating this polish implement that the aforementioned purpose should be attained, rotating a disk. And it is characterized by arranging axis of rotation of said polish implement perpendicularly to said polished surface-ed at the time of polish.

[0010] Thus, the hit of each part of a polish implement to the polished surface-ed of a disk is equalized, consequently it is hard coming to generate partial wear in a polish implement, and the surface smoothness of the polished surface of a polish implement is maintained, and it is hard coming to generate faults, such as a wave, on a disk by arranging the axis of rotation of a polish implement perpendicularly to the polished surface-ed of a disk. Have two or more polish implement maintenance means, and it enables it to press against the polished surface-ed of said disk the polish implement held at said polish implement maintenance means, respectively according to an individual, and is made for said two or more polish implement maintenance means to still more specifically attach and detach alternatively to said polished surface-ed by the cam type elevator style in the desirable mode of this invention.

[0011] Since it becomes unnecessary to choose which shall be pressed against a disk between the polish implement for blemish removal, and the polish implement for polishes, and to exchange them by this when performing blemish removal and a polish to a disk, handling becomes easy and convenience is raised. Moreover, a cam type elevator style etc. enables it to adjust the contact pressure of said polish implement to said polished surface-ed in other desirable modes of this invention. Thereby, even if a polish implement wears out and deforms according to a polish activity, necessary can press against a polish implement, the force can be given, and removal of a blemish or dirt can always be performed proper.

[0012] In another desirable mode of this invention, said polish implement is made cylindrical thru/or cylindrical, and is pressed against said polished surface-ed in the base. Thereby, each part of the polish implement to a disk presses, the force, a hit, etc. become being easy to be equated and the polished surface-ed of a disk can be polished much more equally. Moreover, in other another desirable modes of this invention, the rotation diameter of said polish implement is made larger than the radial width of face of the field in the polished surface-ed of said disk which should be ground. thereby -- a polish implement -- and -- or all the fields in the polished surface-ed of a disk that should be ground can be polished without requiring moving a disk in the direction of a path of a disk, and equipment structure and a device are simplified.

[0013] Furthermore, in another desirable mode of this invention, said polish implement is energized by the spring means at said disk side at the time of polish. the contact surface of a polish implement [ as opposed to a disk by this ] -- it presses, the force is equalized and the polished surface-ed of a

disk can be polished more equally.

[0014]

[Embodiment of the Invention] Hereafter, the gestalt of operation of this invention is explained, referring to a drawing. Drawing 1 shows the appearance of 1 operation gestalt of the disk cleaner concerning this invention. The disk cleaner 10 of an illustration implementation gestalt is that which made 5 inches disks, such as CD, applicable to polish. The hinge region material 14 and 14 (refer to drawing 2 and drawing 4) prepared in the tooth-back side to the lower housing 11 and this lower housing 11 is used as the supporting point. It has the up housing 12 (drawing 2 shows the condition of having opened to max) energized so that it could open automatically up. Said lower housing 11 consists of side \*\*\*\* 11A of a half-ellipse form, bottom plate 11B, and top-face maintenance plate 11C that has a trapezoid crevice so that what is necessary may be just to also refer to drawing 3 - drawing 5 and they may be understood. Moreover, said up housing 12 It consists of rod maintenance plate 12D attached in the central top face of side \*\*\*\* 12A of a half-ellipse form, top-plate 12B, bottom plate 12C that has a reverse trapezoid crevice, and this bottom plate 12C.

[0015] In said lower housing 11, the GIADO motor 25 for a disk rotation drive is held by the overhead position through the maintenance sleeve 28 at said top-face maintenance plate 11C, and it is fixed so that a spindle 26 may rotate with the stop screw 29 at one to output-shaft 25a which has the noncircular-section appearance of this GIADO motor 25. Up major diameter 26a of said spindle 26 can be projected above said top-face maintenance plate 11C, and is closed, and the turntable 20 which is laid in the condition of the disk (CD) 1 having turned that recording surface (polished surface-ed) 1A to this up major diameter 26a up, and having turned non-recording surface (label side) 1B down and which consists of a substrate 21 and a rubber plate 23 is attached. Moreover, between the part below up major diameter 26a of said spindle 26, and said maintenance sleeve 28, the ball bearings 29 and 29 which can respond also to a thrust are arranged.

[0016] On the other hand, in said up housing 12, four guide rods 41, 42, 43, and 44 are perpendicularly arranged so that said top-plate 12B and said rod maintenance plate 12D may be bridged. As for each of these guide rods 41-44, insertion immobilization of the both ends is carried out at said top-plate 12B, and the fixed sleeves 45 and 45 and -- which were fixed by welding etc. to said rod maintenance plate 12D, respectively, respectively. To the guide rods 41 and 42 of the pair located in left-hand side in drawing 3 The supporting guide of the sliding of the \*\*\*\* sliding rise-and-fall member 31 containing the GIADO motor 35 for carrying out the rotation drive of the polish implement 5A mentioned later is made possible. The supporting guide of the vertical sliding of the \*\*\*\* sliding rise-and-fall member 32 containing the GIADO motor 35 for carrying out the rotation drive of the polish implement 5B mentioned later is made possible to the guide rods 43 and 44 of the pair located in right-hand side in drawing 3.

[0017] The sliding sleeves 37 and 37 of the pair made to attach said \*\*\*\* sliding rise-and-fall member 31 outside the guide rods 41 and 42 of said pair besides said GIADO motor 35 respectively possible [ sliding ], The left-hand side tie-down plates 66 and 66 attached so that the vertical edge of the thing of the left-hand side of these sliding sleeves 37 and 37 and the upper and lower sides of the reducer 35A part of said GIADO motor 35 might be connected, By the upper and lower sides attached so that the vertical edge of the thing of the right-hand side of said sliding sleeves 37 and 37 and the upper and lower sides of the reducer 35A part of said GIADO motor 35 might be connected, the \*\*\*\* cam lift plates 67 and 67 of a pair, It has the polish implement holder 50 holding polish implement 5A for blemish removal arranged at said GIADO motor 35 bottom.

[0018] The sliding sleeves 37 and 37 of the pair made to attach said \*\*\*\* sliding rise-and-fall member 32 outside the guide rods 43 and 44 of said pair besides said GIADO motor 35 respectively possible [ sliding ] on the other hand, The right-hand side tie-down plates 69 and 69 attached so that the vertical edge of the thing of the right-hand side of these sliding sleeves 37 and 37 and the upper and lower sides of the reducer 35A part of said GIADO motor 35 might be connected, By the upper and lower sides attached so that the vertical edge of the thing of the left-hand side of said sliding sleeves 37 and 37 and the upper and lower sides of the reducer 35A part of said GIADO motor 35 might be connected, the \*\*\*\* cam lift plates 68 and 68 of a pair, It has the polish implement holder 50 holding polish implement 5B for polishes arranged at said GIADO motor 35 bottom.

[0019] Said polish implement holders 50 and 50 with which said \*\*\*\* sliding rise-and-fall member

31 and the \*\*\*\* sliding rise-and-fall member 32 are equipped As it considers as the same configuration, the thing by the side of said \*\*\*\* sliding rise-and-fall member 31 represents in drawing 6 and it is shown in the detail The connecting shaft 47 with a stage fixed so that it might rotate with the stop screw 49 at one to output-shaft 35a which has the noncircular-section appearance of said GIADO motor 35, The sliding supporter 55 which consists of collar-like part 55b formed successively by the lower limit of drum section 55 with stage a stopped by umbrella-like head 54a of the stop screw 54 which was attached outside by this connecting shaft 47 possible [ sliding ], and was thrust into the lower part of this connecting shaft 47, and this drum section 55a, It has the coil spring 52 \*\*\*\*(ed) between the step of said drum section 55a in this sliding supporter 55, and the step of said connecting shaft 47, and said sliding supporter 55 is always caudad energized with said coil spring 52.

[0020] Polish implement 5 for blemish picking A of the same dimension configuration and polish implement 5B for polishes are attached in the inferior-surface-of-tongue side of collar-like part 55b of said sliding supporter 55 in the polish implement holders 50 and 50 arranged at said right and left possible [ desorption ], respectively so that in addition to drawing 6 what is necessary may be just to refer to drawing 3 , and it may be understood, and axis of rotation Oa and Ob of said polish implement holders 50 and 50 may be made into a medial-axis line. Generally it is called a piece of Velcro by explaining this to a detail, and the attachment implement marketed by brand-name BEROKURO etc. is used for installation of said polish implement 5 for blemish picking A to said sliding supporter 55, and polish implement 5B for polishes.

[0021] Namely, the \*\*\*\* implement 57 of the shape of a circular ring which constitutes one side of said attachment implement through proper cushioning material 55c pastes the inferior surface of tongue of collar-like part 55b of said sliding supporter 55. The disc-like hanging implement 58 which has the piece of a hook of a large number which constitute another side of said attachment implement has pasted the top face of said polish implement 5 for blemish picking A, and polish implement 5B for polishes. By forcing and hooking the piece of a hook of said hanging implement 58 on said \*\*\*\* implement 57, hanging maintenance of the attachment and detachment of polish implement 5 for blemish picking A and polish implement 5B for polishes is enabled to said polish implement holders 50 and 50.

[0022] Here said polish implement 5 for blemish picking A and polish implement 5B for polishes While the abrasives for blemish picking (rough machining) and the abrasives for polishes are made to adhere, respectively and those axes of rotation Oa and Ob are perpendicularly arranged to polished surface-ed 1A of said disk 1 at the time of polish So that it is pressed against said polished surface-ed 1A from the upper part, and those bases may just refer to drawing 7 and may understand it The axes of rotation Oa and Ob are \*\*\*\*(ed) on the straight line which passes along the axis of rotation Oc of the turntable 20 on which said disk 1 is laid, and a spindle 26. And the rotation diameters Ds and Ds of said polish implement 5 for blemish picking A and polish implement 5B for polishes It is made larger than the radial width of face Ls of record section 1b in recording surface (polished surface-ed) 1A of said disk 1 which should be ground, and he is trying to overflow a little out of non-record section 1a to which a part of the periphery section is located in the center of said disk 1, and said disk 1.

[0023] And he is trying for said \*\*\*\* sliding rise-and-fall member 31 and the \*\*\*\* sliding rise-and-fall member 32 equipped with the polish implement holder 50 to attach and detach alternatively to said polished surface-ed 1A by the cam type elevator style 60 in this operation gestalt to enable it to press said polish implement 5 for blemish picking A, and polish implement 5B for polishes against polished surface-ed 1A of said disk 1 according to an individual.

[0024] Said cam type elevator style 60 so that in addition to drawing 3 what is necessary may be just to refer to drawing 4 and drawing 5 and they may be understood The selection dial 61 arranged by the right lateral of said up housing 12, The actuation shaft 65 cross-linking is carried out to the longitudinal direction of said up housing 12, connection immobilization of the right end section is carried out at said selection dial 61, and it was made to rotate to it and one, Ratchet wheel 62b attached in said up housing 12 inside said selection dial 61 by the side of the right end of this actuation shaft 65, and the ratchet mechanism 62 which has pawl 62a, The disk cam 71 by which carry out eccentricity to a left-hand side part a little, attachment immobilization is carried out from

the center section of said actuation shaft 65, and it was made for the inside of the \*\*\*\* cam lift plates 67 and 67 of the vertical pair of said \*\*\*\* sliding rise-and-fall member 31 to \*\*\*\* to the lift (periphery) side, To this disk cam 71, with the phase contrast of 180 degrees, carry out eccentricity to a right-hand side part a little, and attachment immobilization is carried out from the center section of said actuation shaft 65. The disk cam 72 it was made to \*\*\*\* to the lift (periphery) side is provided in the inside of the \*\*\*\* cam lift plates 68 and 68 of the vertical pair of said \*\*\*\* sliding rise-and-fall member 32, and it is constituted.

[0025] In this cam type elevator style 60, whenever it turns said selection dial 61 180 degrees Said \*\*\*\* sliding rise-and-fall member 31 and the \*\*\*\* sliding rise-and-fall member 32 are made to descend by turns. In connection with it, said polish implement 5for blemish picking A and polish implement 5B for polishes which were held at said polish implement holders 50 and 50 are pressed against polished surface-ed 1A of said disk 1 by turns. Furthermore, by adjusting the actuation include angle of said selection dial 61 by the moderation of said ratchet mechanism 62 The downward location of said said \*\*\*\* sliding rise-and-fall member 31 and the \*\*\*\* sliding rise-and-fall member 32, i.e., the contact pressure of said polish implements 5A and 5B to polished surface-ed 1A of said disk 1, can be adjusted now. In addition, the condition that said polish implement 5A for blemish picking has the maximum downward location and said polish implement 5B for polishes in the maximum rise location as for drawing 3 and drawing 4 is shown.

[0026] In addition to the above, Toride 15 with [ for opening and closing it in the transverse-plane lower part ] hanging section 15a is attached in said up housing 12. Said hanging section 15a of this Toride 15 Elasticity is given so that it may bend in the direction of inside and outside at the time of opening and closing of said up housing 12, and it is inserted and hung on stop hole 11a prepared in the transverse-plane side edge section of top-face maintenance plate 11C of said lower housing 11 from the upper part. Moreover, as shown in drawing 4 , when said up housing 12 is opened by max, the buffer type stop members 79 and 79 which stop said hinge region material 14 and 14 are formed in the tooth-back upper part of said lower housing 11.

[0027] furthermore, in the periphery transverse plane of said lower housing 11 A control panel 19 is attached. To this control panel 19 The timer dial 18 grade a start switch 16, the actuation lamp 17, and for polishing time setting is arranged. In the left end section of top-face maintenance plate 11C of said lower housing 11 It is pushed into the location shown as a continuous line from the location where it is pressed by the bottom plate 12C, and the final-control-element 75a is shown with an alternate long and short dash line in drawing 3 when said up housing 12 is shut, as shown in drawing 3 . The safety switch 75 switched to ON condition by it from an OFF condition is arranged. If said safety switch 75 is not in ON condition (i.e., if it is not after the up housing 12 is shut completely), the disk cleaner 10 of this operation gestalt will be started even if it pushes said start switch 16.

[0028] moreover, in the periphery slant surface part of top-face maintenance plate 11C of said lower housing 11 Many exhaust ports 13 and 13 for [ which comes out when said disk 1 is polished by said polish implement 5for blemish picking A and polish implement 5B for polishes so that what is necessary may be just to refer to drawing 2 and drawing 3 and they may be understood ] deleting and discharging dregs, the powder of abrasives, etc. in said lower housing 11, and -- are formed. In the right and left by the side of the tooth back in said lower housing 11 The motor 77 for attracting said shaving dregs, powder of abrasives, etc. through said exhaust ports 13 and 13 and -- and the fans 76 and 76 of 77 drives are formed. In the back side of said lower housing 11 The filters 78 and 78 for carrying out uptake of the powder of said shaving dregs in the air attracted by said fans 76 and 76 or abrasives are formed.

[0029] In case the disk cleaner 10 of this operation gestalt considered as such a configuration is used and the blemish and dirt of a disk 1 are removed Usually, first, push in Toride 15 and the up housing 12 is opened (condition shown in drawing 2 ). Turn a disk 1 on a turntable 20, turn the polished surface-ed 1A up, and it places. the selection dial 61 shall be turned according to the existence of the blemish of a disk 1 etc., and by any it shall polish between polish implement 5for blemish picking A, and polish implement 5B for polishes -- choosing (polish implement 5B for polishes being chosen only with dirt, when there is no blemish) -- Polish implement 5A to a disk 1 or 5B presses, the force is adjusted, the up housing 12 is shut, further, the timer dial 18 is set suitably and a start switch 16 is pushed.

[0030] Where polish implement 5A or 5B chosen by the selection dial 61 is pressed against polished surface-ed 1A of a disk 1 by this, as shown to drawing 7 in a turntable 20, while rotating clockwise Polish implement 5A or 5B currently pressed against polished surface-ed 1A of a disk 1 makes it a rotation counterclockwise rotation, a relative slide contact rate is raised, and polished surface-ed 1A of a disk 1 is polished, and fans 76 and 76 rotate and delete, and suction exclusion of dregs, the powder of abrasives, etc. is carried out from the top-face maintenance plate 11C side.

[0031] Next, if turn said selection dial 61 about 180 degrees, said actuation is repeated, a timer is turned off and the polishing activity of the disk 1 concerned finishes in changing a use polish implement to polish implement 5B for polishes from polish implement 5 for blemish picking A, the up housing 12 will be opened, a disk 1 will be removed, and said actuation will be repeated henceforth.

[0032] As mentioned above, it sets by the disk cleaner 10 of this operation gestalt. Since the axis of rotation Oa and Ob of said polish implement 5 for blemish picking A and polish implement 5B for polishes is perpendicularly arranged to said polished surface-ed 1A at the time of polish The touch area of per unit time amount (one revolution) of each part of said polish implements 5A and 5B to said polished surface-ed 1A is equalized. Consequently, it is hard coming to generate partial wear in said polish implements 5A and 5B, and the surface smoothness of the polished surface (base) of said polish implements 5A and 5B is maintained, and it is hard coming to generate faults, such as a wave, on said disk 1.

[0033] Moreover, he is trying for said two polish implement holders 50 and 50 to attach and detach alternatively on said disk 1 by the cam type elevator style 60. Since it enables it to be pressed according to an individual at polished surface-ed 1A of said disk 1, said polish implements 5A and 5B held at said polish implement holders 50 and 50, respectively Since it becomes unnecessary to choose which shall be pressed against said disk 1 between polish implement 5A for blemish removal, and polish implement 5B for polishes, and to exchange them when performing blemish removal and a polish to said disk 1, handling becomes easy and convenience is raised.

[0034] Furthermore, since the cam type elevator style 60 enables it to be adjusted, even if the polish implements 5A and 5B wear for it out and deform the contact pressure of said polish implements 5A and 5B to polished surface-ed 1A of said disk 1 according to a polish activity, necessary can press it against said polish implements 5A and 5B, the force can be given, and removal of a blemish or dirt can be performed proper. Furthermore, since said polish implements 5A and 5B are made cylindrical thru/or cylindrical and he is trying to press the base against said polished surface-ed 1A, each part of the polish implements 5A and 5B to said disk 1 presses, the touch area per the force and unit time amount etc. becomes being easy to be equated, and polished surface-ed 1A of said disk 1 can be polished much more equally.

[0035] Moreover, the rotation diameters Ds and Ds of said polish implements 5A and 5B are made larger than the radial width of face Ls of field 1b in polished surface-ed 1A of said disk 1 which should be ground. By this, all the fields in the polished surface-ed of said disk 1 that should be ground can be polished at once without requiring said polish implement 5A and 5b Reaching or moving a disk 1 in the direction of a path of this disk 1, and equipment structure and a device are simplified.

[0036] furthermore, the contact surface of the polish implements [ as opposed to / since said polish implements 5A and 5B are energized with a coil spring 52 at said disk 1 side at the time of polish / said disk 1 ] 5A and 5B -- it presses, the force is equalized and polished surface-ed 1A of said disk 1 can be polished more equally.

[0037] As mentioned above, although 1 operation gestalt of this invention was explained in full detail, this invention is not limited to said operation gestalt, is the range which does not deviate from the pneuma of invention indicated by the claim, and can perform various modification in a design. For example, although one side of 5 inches disks, such as CD, is made applicable to polish, the disk cleaner 10 of said operation gestalt can be easily designed in conformity with the same technical thought, if that which made applicable to polish other disks with which it is not restricted to it but the sizes of a laser disc etc. differ, the thing which made both sides of a disk applicable to polish are these contractors.

[0038]

[Effect of the Invention] According to the disk cleaner concerning this invention, without making a disk produce faults, such as a wave, the blemish and dirt with which the disk was stained are removable proper, and while being able to change a polish implement easily, moreover, the outstanding effectiveness that it can be dealt with easily is done so, so that I may be understood from the above explanation.

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**CLAIMS**

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[Claim(s)]

[Claim 1] In the disk cleaner press [ cleaner ] polish implement 5A (5B) which is made to rotate a disk 1 and turns into polished surface-ed 1A of this disk 1 from a buff etc., rotates this polish implement 5A (5B), and it is made to have said polished surface-ed 1A polished The disk cleaner characterized by arranging perpendicularly the axis of rotation Oa (Ob) of said polish implement 5A (5B) to said polished surface-ed 1A at the time of polish.

[Claim 2] The disk cleaner according to claim 1 characterized by enabling attachment and detachment of said polish implement 5A (5B) in the vertical direction to said disk 1.

[Claim 3] The disk cleaner according to claim 1 or 2 characterized by the ability to press the polish implements 5A and 5B which have two or more polish implement maintenance means 50 and 50, and were held at each of these polish implement maintenance means 50 and 50 according to an individual at polished surface-ed 1A of said disk 1.

[Claim 4] The disk cleaner according to claim 3 characterized by said two or more polish implement maintenance means 50 and 50 attaching and detaching alternatively to said polished surface-ed 1A by the cam type elevator style 60.

[Claim 5] The disk cleaner according to claim 3 or 4 characterized by said two or more polish implement maintenance means 50 and 50 being made to rotate by the individual exception.

[Claim 6] A disk cleaner given in claim 1 characterized by the ability to adjust the contact pressure of said polish implements 5A and 5B to said polished surface-ed 1A thru/or any 1 term of 5.

[Claim 7] A disk cleaner given in claim 1 characterized by making said polish implements 5A and 5B cylindrical thru/or cylindrical, and pressing them against said polished surface-ed 1A in the base thru/or any 1 term of 6.

[Claim 8] A disk cleaner given in claim 1 characterized by making the rotation diameters Ds and Ds of said polish implements 5A and 5B larger than the radial width of face Ls of field 1b in polished surface-ed 1A of said disk 1 which should be ground thru/or any 1 term of 7.

[Claim 9] A disk cleaner given in claim 1 characterized by energizing said polish implements 5A and 5B by the spring means 52 and 52 at said disk 1 side at the time of polish thru/or any 1 term of 8.

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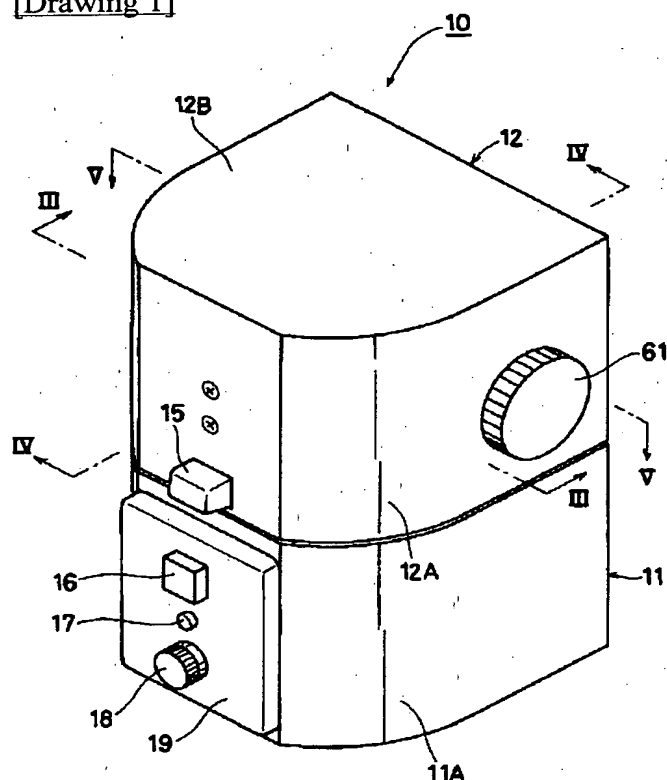
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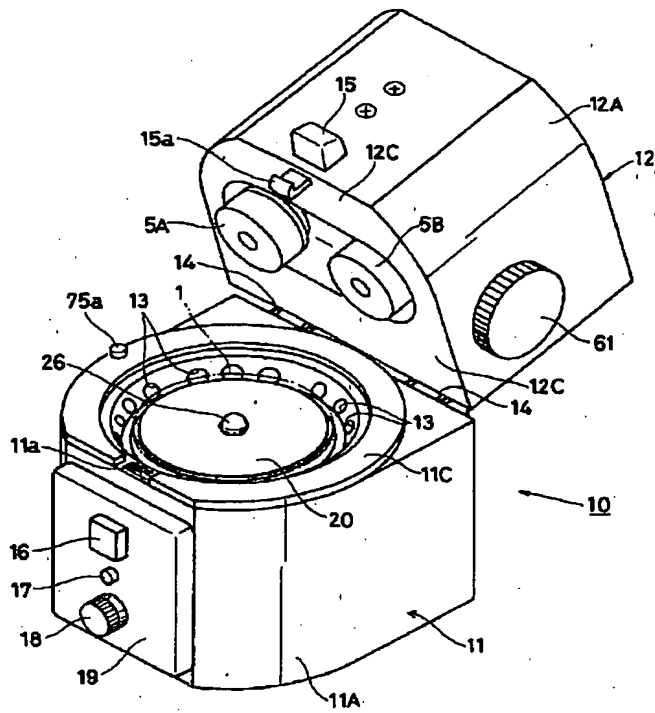
**DRAWINGS**

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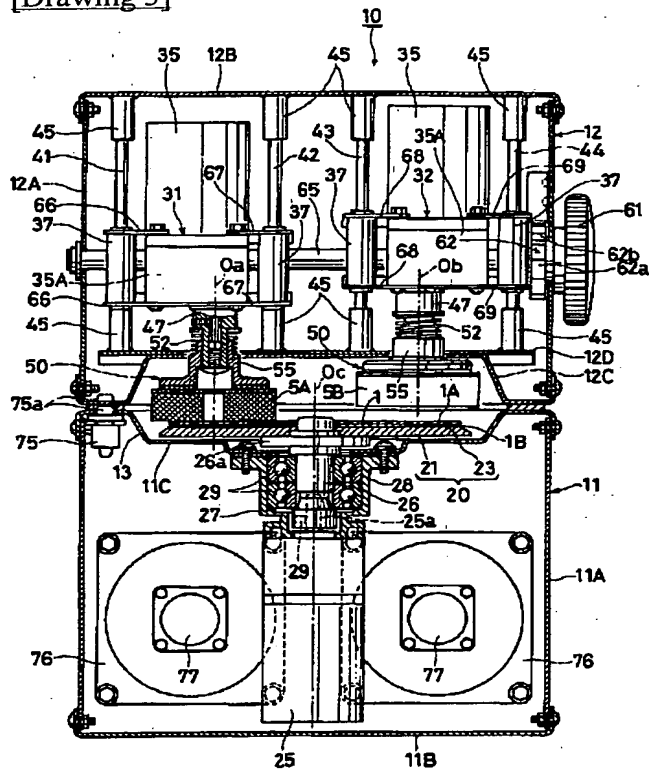
[Drawing 1]



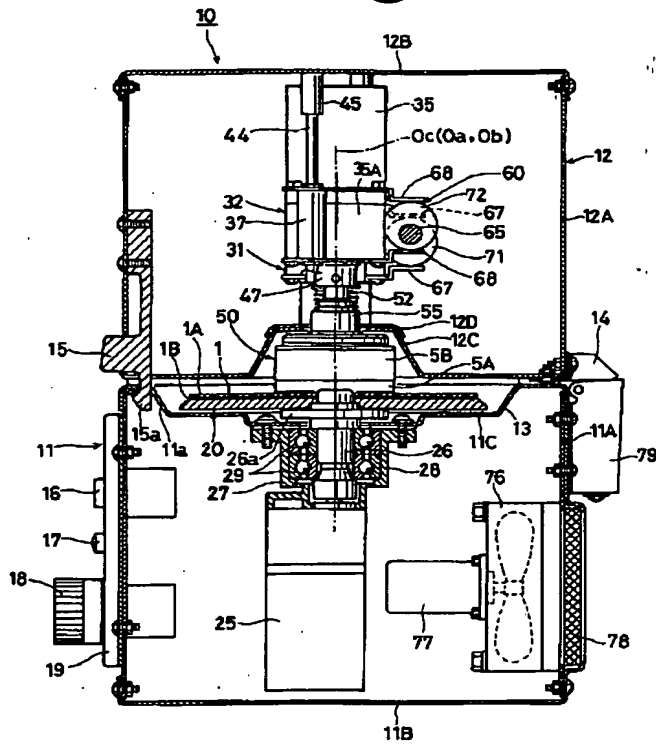
[Drawing 2]



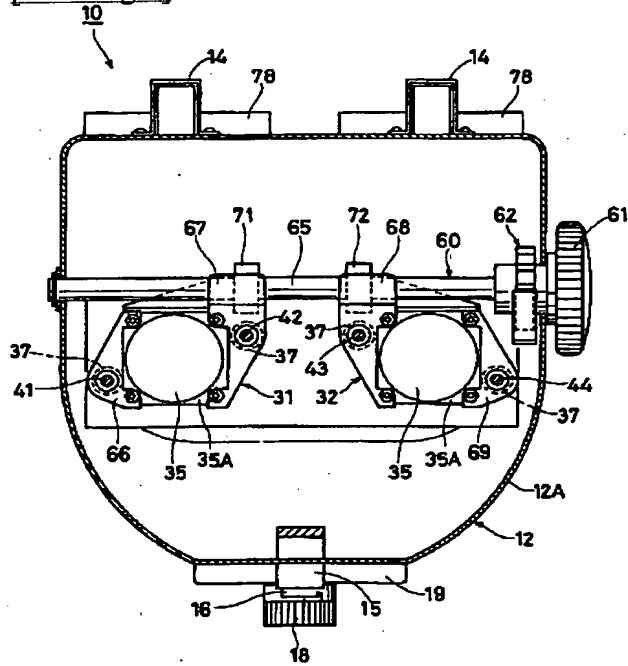
[Drawing 3]



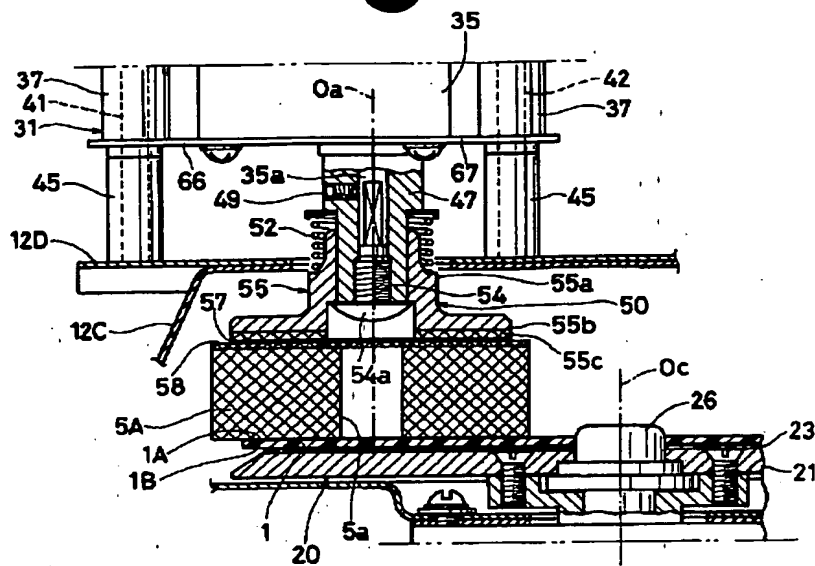
[Drawing 4]



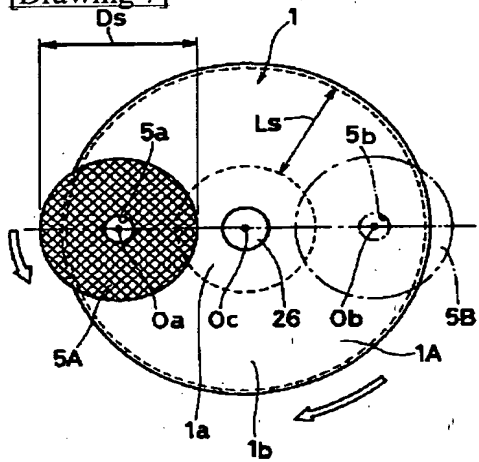
[Drawing 5]



[Drawing 6]



[Drawing 7]



[Translation done.]

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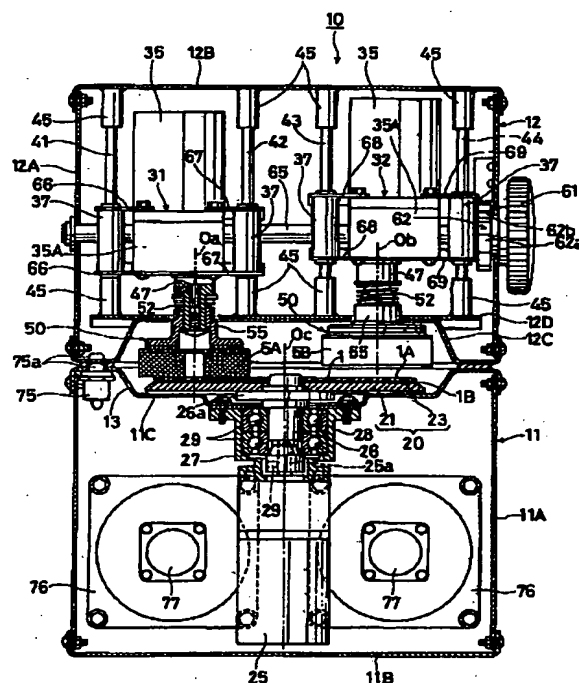
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(54) 【発明の名称】 ディスククリーナ

(57) 【要約】

【課題】 ディスクにうねり等の不具合を生じさせることなく、ディスクに付いた傷や汚れを適正に除去でき、かつ、研磨具の切り替えを簡単に行えとともに、容易に取り扱うことができるディスククリーナを提供する。

【解決手段】 ディスク1を回転させながら、前記ディスク1の被研磨面1Aにバフ等からなる研磨具5A(5B)を押し当てて、該研磨具5A(5B)を回転させることにより、前記被研磨面1Aを磨くようにされ、前記研磨具5A(5B)の回転軸線Oa(Ob)が研磨時に前記被研磨面1Aに対して垂直に配置されている。



## 【特許請求の範囲】

【請求項1】 ディスク1を回転させて該ディスク1の被研磨面1Aにバフ等からなる研磨具5A(5B)を押し当てて該研磨具5A(5B)を回転させて前記被研磨面1Aを磨くようにされたディスククリーナにおいて、前記研磨具5A(5B)の回転軸線Oa(Ob)が研磨時に前記被研磨面1Aに対して垂直に配置されることを特徴とするディスククリーナ。

【請求項2】 前記ディスク1に対して前記研磨具5A(5B)が上下方向に接離可能とされていることを特徴とする請求項1に記載のディスククリーナ。

【請求項3】 複数の研磨具保持手段50、50を有し、該研磨具保持手段50、50のそれぞれに保持された研磨具5A、5Bを前記ディスク1の被研磨面1Aに個別に押し当てることができることを特徴とする請求項1又は2に記載のディスククリーナ。

【請求項4】 前記複数の研磨具保持手段50、50がカム式昇降機構60により前記被研磨面1Aに対して選択的に接離することを特徴とする請求項3に記載のディスククリーナ。

【請求項5】 前記複数の研磨具保持手段50、50が個別に回転せしめられることを特徴とする請求項3又は4に記載のディスククリーナ。

【請求項6】 前記被研磨面1Aに対する前記研磨具5A、5Bの圧接力を調節できることを特徴とする請求項1乃至5のいずれか一項に記載のディスククリーナ。

【請求項7】 前記研磨具5A、5Bが円柱状乃至円筒状とされていてその底面を前記被研磨面1Aに押し当てるようにされていることを特徴とする請求項1乃至6のいずれか一項に記載のディスククリーナ。

【請求項8】 前記研磨具5A、5Bの回転直径Ds、Dsが、前記ディスク1の被研磨面1Aにおける研磨すべき領域1bの半径方向の幅Lsより大きくされていることを特徴とする請求項1乃至7のいずれか一項に記載のディスククリーナ。

【請求項9】 前記研磨具5A、5Bが研磨時にばね手段52、52により前記ディスク1側に付勢されるようになっていることを特徴とする請求項1乃至8のいずれか一項に記載のディスククリーナ。

## 【発明の詳細な説明】

## 【0001】

【発明の属する技術分野】本発明は、情報記録媒体としての光ディスクあるいは光磁気ディスク等のディスクの表面に付いた傷や汚れ等を除去するために使用されるディスククリーナに関し、特に、前記ディスクを回転させながらその被研磨面にバフ等からなる研磨具を押し当てて回転させることにより、前記被研磨面を磨くようにされたものに関する。

## 【0002】

【従来の技術】近年、音響・映像用あるいはコンピュー

ター用の情報記録媒体として、レーザーディスク、CD(コンパクトディスク)、CD-ROM等のディスクが一般に広く普及しているが、このようなディスクにおいては、その表面、特に記録面に傷や汚れ等が付くと、見た目が悪くなるだけでなく、その傷や汚れが付いた部分の記録情報が読み取れなくなり、適正に再生できなくなる。

【0003】そのため、従来においては、クロス等を使用して手作業でディスクの傷や汚れ等を落とすようにしているが、手作業では、手間及び時間がかかるとともに、傷や汚れ等を充分には除去できない。特に、中古CD店や図書館等のディスクを大量に保有し、頻繁に入替えあるいは貸出しが行われるところでは、ディスクの傷や汚れの除去に多大な労力が割かれることになるので、このディスクの傷や汚れの除去を手作業ではなく機械的かつ自動的に行えるようにすることが強く望まれている。

【0004】このような要望に応えるべく、従来、例えば特開平7-122038号公報には、ディスクを回転させながら、そのディスクの被研磨面(記録面)にバフ等の円筒状の研磨具の回転周面を押し当てて、該研磨具を回転させることにより、前記被研磨面を磨くようにされたディスククリーナが提案されている。

## 【0005】

【発明が解決しようとする課題】ところで、前記提案のディスククリーナにあつては、次のような問題があつた。すなわち、①前記提案のものは、ディスクの被研磨面に研磨具の回転周面を押し当てるようにされている。言い換えれば、前記研磨具の回転軸線が研磨時に前記被研磨面に対して平行に配置されるので、研磨具の、例えば先端側は常にディスクの内周部分に、後端側は常にディスクの外周部分というようにディスクの各部分に対して研磨具の同一側周部が押し当てられることになる。この場合、ディスクの内周部分の周速度より外周部分の周速度の方が速いので、研磨具の同筒度、及び被研磨面との平行度が正確に維持されていないと、ディスクの全表面にうねり等が生じやすくなる。

【0006】②ディスクを磨くにあつては、研磨具として、荒削り用(傷除去用)のものとポリッシュ用(つや出し、仕上げ用)のものを用意しておくことが望ましい。前記提案のものは、ディスクの一つの被研磨面に対して一個の研磨具しか押し当てられないので、傷除去用の研磨具とポリッシュ用の研磨具とを頻繁に交換しなければならず、不便である。

【0007】③前記提案のものでは、ディスクに対する研磨具の押し当て力を調節できない。研磨具は研磨作業により摩耗、変形してくるので、押し当て力を調節できないと、研磨具に所要の押し当て力が付与されなくなり、傷や汚れの除去を適正に行えなくなるおそれがある。

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④前記提案のものでは、ディスクの着脱を行う際及び研磨具の交換等を行う際に、ディスク保持用アームをディスク駆動モータを伴ってディスクの径方向（水平方向）に揺動させなければならず、取り扱いが面倒である。

【0008】⑤前記提案のものでは、前記のように研磨具の円筒度や被研磨面との平行度を正確に維持する必要があるにもかかわらず、それに対する有効な手段を講じていないので、ディスクに対する研磨具の接触面での押し当て力がばらつき、ディスクを均一に磨くことができない。本発明は、このような問題に鑑みてなされたもので、その目的とするところは、ディスクにうねり等の不具合を生じさせることなく、ディスクに付いた傷や汚れを適正に除去でき、かつ、研磨具の切り替えを簡単に行えとともに、容易に取り扱うことができるようにされたディスククリーナを提供することにある。

【0009】

【課題を解決するための手段】前記の目的を達成すべく、本発明に係るディスククリーナは、基本的には、ディスクを回転させながら、前記ディスクの被研磨面にバフ等からなる研磨具を押し当てて、該研磨具を回転させることにより、前記被研磨面を磨くようにされる。そして、前記研磨具の回転軸線が研磨時に前記被研磨面に対して垂直に配置されるようになっていてことを特徴としている。

【0010】このように、ディスクの被研磨面に対して研磨具の回転軸線を垂直に配置することにより、ディスクの被研磨面に対する研磨具の各部の当たりが均一化され、その結果、研磨具に偏摩耗が生じ難くなり、研磨具の研磨面の平坦性が維持され、ディスクにうねり等の不具合が生じ難くなる。本発明の好ましい態様では、複数の研磨具保持手段を有し、前記研磨具保持手段にそれぞれ保持された研磨具を前記ディスクの被研磨面に個別に押し当てることできるようにされ、さらに具体的には、前記複数の研磨具保持手段がカム式昇降機構により前記被研磨面に対して選択的に接離するようにされる。

【0011】これにより、ディスクに対して傷除去とポリッシュとを行う場合に、傷除去用の研磨具とポリッシュ用の研磨具のどちらをディスクに押し当てるかを選択するだけで済み、それらを交換する必要がなくなるので、取り扱いが容易となり、利便性が高められる。また、本発明の他の好ましい態様では、前記被研磨面に対する前記研磨具の圧接力をカム式昇降機構等により調節できるようにされる。これにより、研磨具が研磨作業により摩耗、変形しても、研磨具に所要の押し当て力を付与でき、傷や汚れの除去を常に適正に行える。

【0012】本発明の別の好ましい態様では、前記研磨具が円柱状乃至円筒状とされていてその底面を前記被研磨面に押し当てるようにされる。これにより、ディスクに対する研磨具の各部の押し当て力、当たり等が均等化

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されやすくなり、ディスクの被研磨面を一層均等に磨くことができる。また、本発明の別の他の好ましい態様では、前記研磨具の回転直径が、前記ディスクの被研磨面における研磨すべき領域の半径方向の幅より大きくされる。これにより、研磨具及び又はディスクをディスクの径方向に移動させることを要しないでディスクの被研磨面における研磨すべき全領域を磨くことができ、装置構造・機構が簡素化される。

【0013】さらに、本発明のもう一つの好ましい態様では、前記研磨具が研磨時にばね手段により前記ディスク側に付勢されるようになっている。これにより、ディスクに対する研磨具の接触面での押し当て力が均一化され、ディスクの被研磨面をより均等に磨くことができる。

【0014】

【発明の実施の形態】以下、本発明の実施の形態を図面を参照しつつ説明する。図1は本発明に係るディスククリーナの一実施形態の外形を示している。図示実施形態のディスククリーナ10は、CD等の5インチのディスクを研磨対象としたもので、下部ハウジング11と、この下部ハウジング11に対して背面側に設けられたヒンジ部材14、14（図2、図4参照）を支点として、上方に自動的に開くことができるように付勢された上部ハウジング12（図2は最大に開いた状態を示す）とを有し、前記下部ハウジング11は、図3～図5をも参照すればよくわかるように、半楕円形の側周板11Aと、底板11Bと、台形凹部を有する上面保持板11Cとからなり、また、前記上部ハウジング12は、半楕円形の側周板12Aと、天板12Bと、逆台形凹部を有する底板12Cと、この底板12Cの中央上面に取り付けられたロッド保持板12Dからなっている。

【0015】前記下部ハウジング11内には、前記上面保持板11Cに保持スリーブ28を介してディスク回転駆動用のギアードモータ25が上向き姿勢で保持されており、このギアードモータ25の非円形断面外形を有する出力軸25aにスピンドル26が止めネジ29により一体に回転するように固定されている。前記スピンドル26の上部大径部26aは前記上面保持板11Cの上方に突出せしめられ、この上部大径部26aにディスク（CD）1がその記録面（被研磨面）1Aを上にし非記録面（ラベル面）1Bを下にした状態で載置される、基板21、及びゴム板23からなるターンテーブル20が取り付けられている。また、前記スピンドル26の上部大径部26aより下側の部分と前記保持スリーブ28との間にはスラストにも対応できるボールベアリング29、29が配置されている。

【0016】一方、前記上部ハウジング12内には、前記天板12Bと前記ロッド保持板12Dとを橋絡するように垂直に四本のガイドロッド41、42、43、44が配置されている。これらの各ガイドロッド41～44



は、その両端がそれぞれ前記天板12Bと前記ロッド保持板12Dにそれぞれ溶接等により固着された固定スリーブ45、45、…に挿入固定されており、図3において左側に位置する一対のガイドロッド41、42には、後述する研磨具5Aを回転駆動するためのギアードモータ35を含む左置摺動昇降部材31が摺動可能に支持案内され、図3において右側に位置する一対のガイドロッド43、44には、後述する研磨具5Bを回転駆動するためのギアードモータ35を含む右置摺動昇降部材32が上下摺動可能に支持案内される。

【0017】前記左置摺動昇降部材31は、前記ギアードモータ35の他、前記一対のガイドロッド41、42にそれぞれ摺動可能に外嵌せしめられた一対の摺動スリーブ37、37と、これらの摺動スリーブ37、37のうちの左側のものの上下端と前記ギアードモータ35の減速機35A部分の上下とを連結するように取り付けられた左側取付板66、66と、前記摺動スリーブ37、37のうちの右側のものの上下端と前記ギアードモータ35の減速機35A部分の上下とを連結するように取り付けられた上下で一対の左置カムリフト板67、67と、前記ギアードモータ35の下側に配置された傷除去用研磨具5Aを保持する研磨具保持具50とを備えている。

【0018】一方、前記右置摺動昇降部材32は、前記ギアードモータ35の他、前記一対のガイドロッド43、44にそれぞれ摺動可能に外嵌せしめられた一対の摺動スリーブ37、37と、これらの摺動スリーブ37、37のうちの右側のものの上下端と前記ギアードモータ35の減速機35A部分の上下とを連結するように取り付けられた右側取付板69、69と、前記摺動スリーブ37、37のうちの左側のものの上下端と前記ギアードモータ35の減速機35A部分の上下とを連結するように取り付けられた上下で一対の右置カムリフト板68、68と、前記ギアードモータ35の下側に配置されたポリッシュ用研磨具5Bを保持する研磨具保持具50とを備えている。

【0019】前記左置摺動昇降部材31及び右置摺動昇降部材32に備えられる前記研磨具保持具50、50は、同一構成とされており、図6に前記左置摺動昇降部材31側のものが代表して詳細に示されているように、前記ギアードモータ35の非円形断面外形を有する出力軸35aに止めネジ49により一体に回転するように固定された段付き連結軸47と、この連結軸47に摺動可能に外嵌され、該連結軸47の下部に螺入された止めネジ54の傘状頭部54aに係止される段付き胴部55a及びこの胴部55aの下端に連設された銑状部55bとからなる摺動保持体55と、該摺動保持体55における前記胴部55aの段部と前記連結軸47の段部との間に縮装されたコイルバネ52とを備えており、前記摺動保持体55は前記コイルバネ52により常時下方に付勢さ

れている。

【0020】前記左右に配置された研磨具保持具50、50における前記摺動保持体55の銑状部55bの下面側には、図6に加えて図3を参照すればよくわかるように、前記研磨具保持具50、50の回転軸線Oa、Obを中心軸線とするように、それぞれ同一寸法形状の傷取り用研磨具5A、ポリッシュ用研磨具5Bが脱着可能に取り付けられている。これを詳細に説明するに、前記摺動保持体55に対する前記傷取り用研磨具5A、ポリッシュ用研磨具5Bの取り付けには、一般にマジックテープと称され、商標名ベロクロ等で市販されている取着具が用いられている。

【0021】すなわち、前記摺動保持体55の銑状部55bの下面に、適宜のクッション材55cを介して前記取着具の一方を構成する円環状の受止具57が接着され、前記傷取り用研磨具5A及びポリッシュ用研磨具5Bの上面に、前記取着具の他方を構成する多数の引っ掛け片を有する円板状の掛止具58が接着されており、前記掛止具58の引っ掛け片を前記受止具57に押し付けて引っ掛けることにより、前記研磨具保持具50、50に傷取り用研磨具5A及びポリッシュ用研磨具5Bが着脱自在に掛止保持される。

【0022】ここで、前記傷取り用研磨具5A及びポリッシュ用研磨具5Bは、それぞれ傷取り（荒削り）用の研磨材、ポリッシュ用の研磨材が付着せしめられており、それらの回転軸線Oa、Obが研磨時に前記ディスク1の被研磨面1Aに対して垂直に配置されるとともに、それらの底面が前記被研磨面1Aに上方より押し当てられるようになっていて、図7を参照すればよくわかるように、その回転軸線Oa、Obが前記ディスク1が載置されるターンテーブル20及びスピンドル26の回転軸線Ocを通る一直線上に配在され、かつ、前記傷取り用研磨具5A及びポリッシュ用研磨具5Bの回転直径Ds、Dsが、前記ディスク1の記録面（被研磨面）1Aにおける研磨すべき記録領域1bの半径方向の幅Lsより大きくされており、その外周部の一部が前記ディスク1の中央に位置する非記録領域1a及び前記ディスク1外に若干はみ出すようにされている。

【0023】そして、本実施形態においては、前記傷取り用研磨具5A及びポリッシュ用研磨具5Bを前記ディスク1の被研磨面1Aに個別に押し当てることができるようにすべく、研磨具保持具50を備えた前記左置摺動昇降部材31及び右置摺動昇降部材32が、カム式昇降機構60により前記被研磨面1Aに対して選択的に接離するようにされている。

【0024】前記カム式昇降機構60は、図3に加えて図4及び図5を参照すればよくわかるように、前記上部ハウジング12の右側面に配設された選択ダイヤル61と、前記上部ハウジング12の左右方向に橋架されその右端部が前記選択ダイヤル61に連結固定されてそれと

一体に回転するようにされた操作シャフト65と、該操作シャフト65の右端側における前記選択ダイヤル61より内側の前記上部ハウジング12内に取り付けられた爪車62bと爪62aを有するラチェット機構62と、前記操作シャフト65の中央部より若干左側部分に偏心して取付固定され、前記左置摺動昇降部材31の上下一対の左置カムリフト板67、67の内面にそのリフト

(外周)面が摺接するようにされた円板カム71と、この円板カム71に対して180度の位相差をもって前記操作シャフト65の中央部より若干右側部分に偏心して取付固定され、前記右置摺動昇降部材32の上下一対の右置カムリフト板68、68の内面にそのリフト(外周)面が摺接するようにされた円板カム72と、を具備して構成されている。

【0025】かかるカム式昇降機構60においては、前記選択ダイヤル61を180度回す毎に、前記左置摺動昇降部材31と右置摺動昇降部材32とが交互に下降せしめられ、それに伴って、前記研磨具保持具50、50に保持された前記傷取り用研磨具5A及びポリッシュ用研磨具5Bが前記ディスク1の被研磨面1Aに交互に押し当てられ、さらに、前記選択ダイヤル61の操作角度を前記ラチェット機構62の節度により加減することにより、前記前記左置摺動昇降部材31と右置摺動昇降部材32の下降位置、つまり、前記ディスク1の被研磨面1Aに対する前記研磨具5A、5Bの圧接力を調節できるようになっている。なお、図3及び図4は、前記傷取り用研磨具5Aが最下降位置、前記ポリッシュ用研磨具5Bが最上昇位置にある状態が示されている。

【0026】以上に加え、前記上部ハウジング12には、その正面下部にそれを開け閉めするための掛止部15a付きの取手15が取り付けられ、該取手15の前記掛止部15aは、前記上部ハウジング12の開け閉め時にその内外方向に撓むように弾性を付与されていて、前記下部ハウジング11の上面保持板11Cの正面側端部に設けられた係止穴11aに上方から挿入されて掛止されるようになっている。また、前記下部ハウジング11の背面上部には、図4に示される如くに、前記上部ハウジング12が最大に開かれたとき、前記ヒンジ部材14、14を係止する緩衝式係止部材79、79が設けられている。

【0027】さらに、前記下部ハウジング11の外周正面には、操作パネル19が取り付けられ、該操作パネル19には、起動スイッチ16、作動ランプ17、磨き時間設定用のタイマーダイヤル18等が配設され、また、前記下部ハウジング11の上面保持板11Cの左端部には、図3に示される如くに、前記上部ハウジング12が閉められたときその底板12Cにより押圧されてその操作端75aが図3において一点鎖線で示される位置から実線で示される位置に押し込まれ、それによってOFF状態からON状態に切り換えられる安全スイッチ75が

配設されている。本実施形態のディスククリーナ10は、前記安全スイッチ75がON状態でないと、つまり、上部ハウジング12が完全に閉められた後でないと、前記起動スイッチ16を押しても起動しないようになっている。

【0028】また、前記下部ハウジング11の上面保持板11Cの外周斜面部には、図2及び図3を参照すればよくわかるように、前記ディスク1を前記傷取り用研磨具5A及びポリッシュ用研磨具5Bで磨いた際に出て来る削りカスや研磨材の粉等を前記下部ハウジング11内に排出するための多数の排出口13、13、…が形成されており、前記下部ハウジング11内の背面側の左右には、前記削りカスや研磨材の粉等を前記排出口13、13、…を通じて吸引するためのモータ77、77駆動のファン76、76が設けられ、前記下部ハウジング11の背後面には、前記ファン76、76により吸引された空気中の前記削りカスや研磨材の粉を捕集するためのフィルタ78、78が設けられている。

【0029】このような構成とされた本実施形態のディスククリーナ10を使用して、ディスク1の傷や汚れを除去する際には、通常、まず、取手15を押し込んで上部ハウジング12を開け(図2に示される状態)、ターンテーブル20上にディスク1をその被研磨面1Aを上にして置き、ディスク1の傷の有無等に応じて選択ダイヤル61を回して傷取り用研磨具5A及びポリッシュ用研磨具5Bのいずれで磨くのかを選択する(汚れだけで傷が無い場合はポリッシュ用研磨具5Bを選択する)とともに、ディスク1に対する研磨具5A又は5Bの押し当て力を調節して上部ハウジング12を閉め、さらに、タイマーダイヤル18を適宜にセットして起動スイッチ16を押す。

【0030】これにより、選択ダイヤル61により選択された研磨具5A又は5Bがディスク1の被研磨面1Aに押し当てられた状態でターンテーブル20が図7に示す如く時計方向に回転するとともに、ディスク1の被研磨面1Aに押し当てられている研磨具5A又は5Bが回転反時計方向にして相対摺接速度を高められて、ディスク1の被研磨面1Aが磨かれ、また、ファン76、76が回転して削りカスや研磨材の粉等が上面保持板11C側から吸引排除される。

【0031】次に、使用研磨具を傷取り用研磨具5Aからポリッシュ用研磨具5Bに替える場合には、前記選択ダイヤル61を約180度回して前記操作を繰り返し、タイマーが切れて当該ディスク1の磨き作業が終われば、上部ハウジング12を開けてディスク1を取り出し、以後、前記操作を繰り返す。

【0032】前記のように、本実施形態のディスククリーナ10においては、前記傷取り用研磨具5A及びポリッシュ用研磨具5Bの回転軸線Oa、Obが研磨時に前記被研磨面1Aに対して垂直に配置されるので、前記被

研磨面 1 A に対する前記研磨具 5 A, 5 B の各部の単位時間（一回転）当たりの接触面積が均一化され、その結果、前記研磨具 5 A, 5 B に偏摩耗が生じ難くなり、前記研磨具 5 A, 5 B の研磨面（底面）の平坦性が維持され、前記ディスク 1 にうねり等の不具合が生じ難くなる。

【0033】また、前記二個の研磨具保持具 5 0, 5 0 がカム式昇降機構 6 0 により前記ディスク 1 に対して選択的に接離するようにされており、前記研磨具保持具 5 0, 5 0 にそれぞれ保持された前記研磨具 5 A, 5 B を前記ディスク 1 の被研磨面 1 A に個別に押し当てること  
10 ができるようにされているので、前記ディスク 1 に対して傷除去とポリッシュとを行う場合に、傷除去用の研磨具 5 A とポリッシュ用の研磨具 5 B のどちらを前記ディスク 1 に押し当てるかを選択するだけで済み、それらを交換する必要がなくなるので、取り扱いが容易となり、利便性が高められる。

【0034】さらに、前記ディスク 1 の被研磨面 1 A に対する前記研磨具 5 A, 5 B の圧接力をカム式昇降機構 6 0 により調節できるようにされているので、研磨具 5 A, 5 B が研磨作業により摩耗、変形しても、前記研磨具 5 A, 5 B に所要の押し当て力を付与でき、傷や汚れの除去を適正に行える。またさらに、前記研磨具 5 A, 5 B が円柱状乃至円筒状とされておりその底面を前記被研磨面 1 A に押し当てるようにされているので、前記ディスク 1 に対する研磨具 5 A, 5 B の各部の押し当て力、単位時間当たりの接触面積等が均等化されやすくなり、前記ディスク 1 の被研磨面 1 A を一層均等に磨くことができる。

【0035】また、前記研磨具 5 A, 5 B の回転直径  $D_s$ ,  $D_s$  が、前記ディスク 1 の被研磨面 1 A における研磨すべき領域 1 b の半径方向の幅  $L_s$  より大きくされる。これにより、前記研磨具 5 A, 5 B 及び又はディスク 1 を該ディスク 1 の径方向に移動させることを要しないで前記ディスク 1 の被研磨面における研磨すべき全領域を一度に磨くことができ、装置構造・機構が簡素化される。

【0036】さらに、前記研磨具 5 A, 5 B が研磨時にコイルバネ 5 2 により前記ディスク 1 側に付勢されるようになっているので、前記ディスク 1 に対する研磨具 5 A, 5 B の接触面での押し当て力が均一化され、前記ディスク 1 の被研磨面 1 A をより均等に磨くことができ  
40

る。

【0037】以上、本発明の一実施形態について詳述したが、本発明は、前記実施形態に限定されるものではなく、特許請求の範囲に記載された発明の精神を逸脱しない範囲で、設計において、種々の変更ができるものである。例えば、前記実施形態のディスククリーナ 1 0 は、CD 等の 5 インチのディスクの片面を研磨対象としたものであるが、それに限られずレーザーディスク等のサイズの異なる他のディスクを研磨対象としたものや、ディスクの両面を研磨対象としたもの等も当業者なら同一技術思想に則って容易に設計できる。

【0038】

【発明の効果】以上の説明から理解されるように、本発明に係るディスククリーナによれば、ディスクにうねり等の不具合を生じさせることなく、ディスクに付いた傷や汚れを適正に除去でき、しかも、研磨具の切り替えを簡単に行えらるとともに、容易に取り扱うことができるといった優れた効果を奏する。

【図面の簡単な説明】

【図 1】本発明に係るディスククリーナー実施形態の外観を示す斜視図。

【図 2】図 1 に示されるディスククリーナーの上部ハウジングを開けた状態を示す斜視図。

【図 3】図 1 の III-III 矢視断面図。

【図 4】図 1 の IV-IV 矢視断面図。

【図 5】図 1 の V-V 矢視断面図。

【図 6】図 3 に示される研磨具保持具周辺の拡大断面図。

【図 7】図 1 に示されるディスククリーナーの研磨具とディスクとの配置関係等を示す図。

【符号の説明】

1…ディスク (CD)

1 A…被研磨面

1 b…研磨すべき領域

5 A…傷取り用研磨具

5 B…ポリッシュ用研磨具

5 0…研磨具保持具

5 2…コイルバネ (ばね手段)

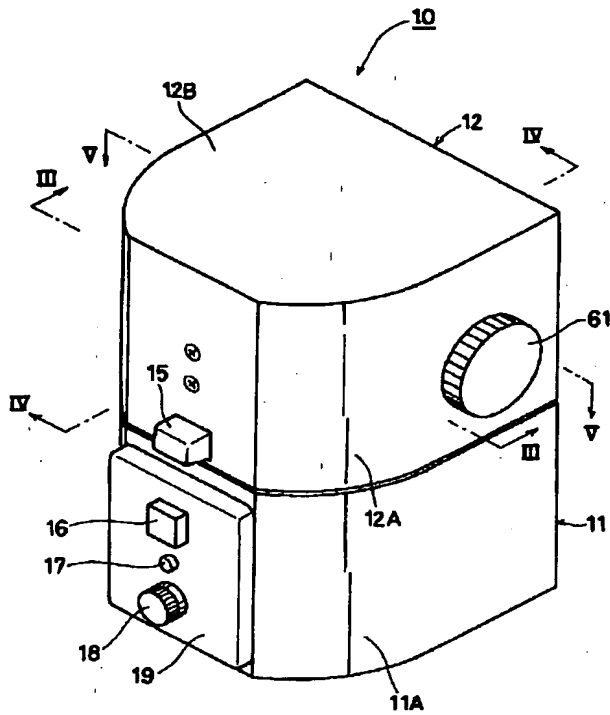
6 0…カム式昇降機構

0 a, 0 b…研磨具の回転軸線

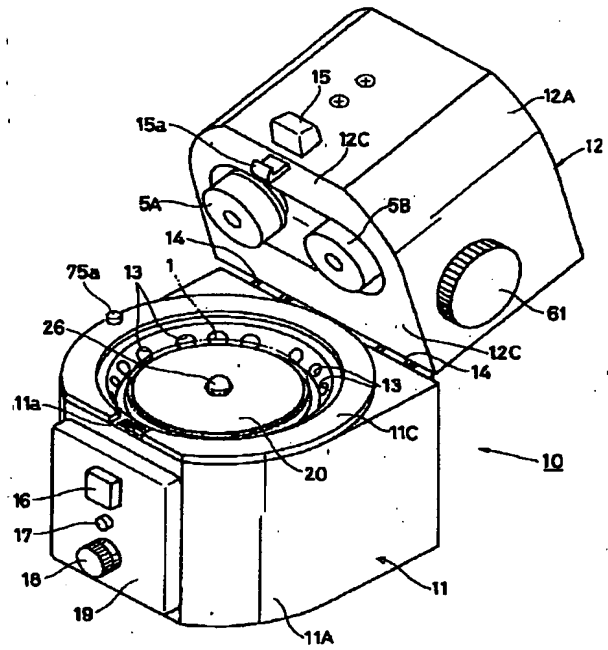
$D_s$ …研磨具の回転直径

$L_s$ …研磨すべき領域の半径方向の幅

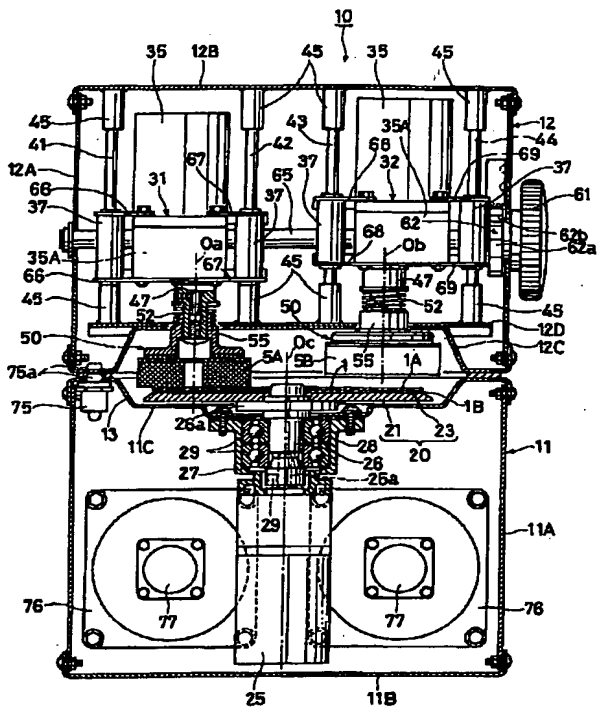
【図 1】



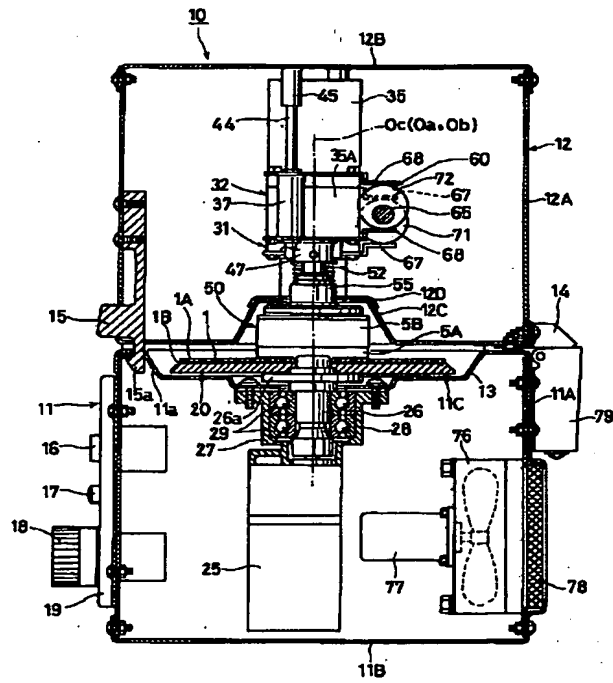
【図 2】



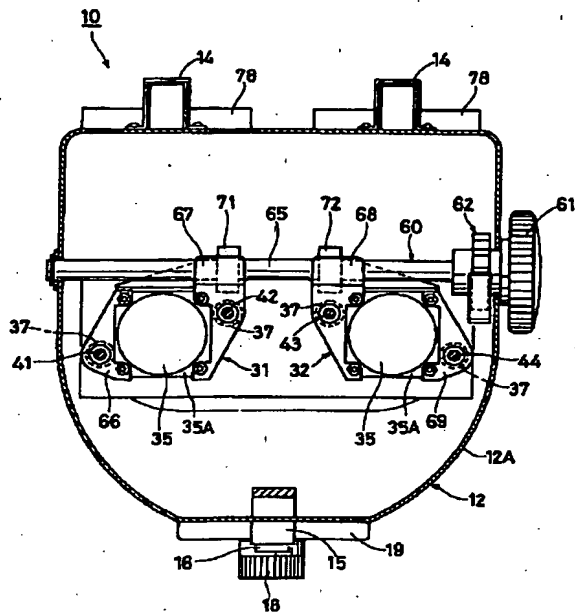
【図 3】



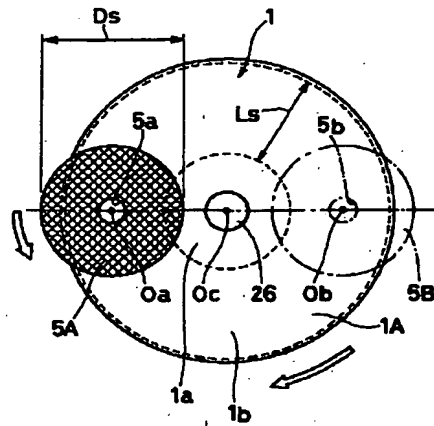
【図 4】



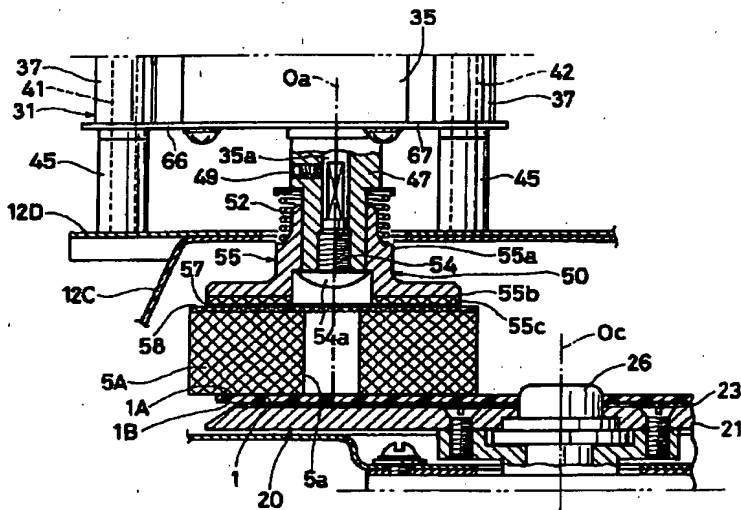
【図 5】



【図 7】



【図 6】



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